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Claims

1.   A method for testing a magnetoresistive solid-state storage device, the method comprising the steps of:

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accessing a set of magnetoresistive storage cells, the set being arranged in use to store at least one block of ECC encoded data; and

10   determining whether the accessed set of storage cells is suitable for, in use, storing at least one block of ECC encoded data.

2.   The method of claim 1, comprising determining
15 whether there is a greater than acceptable probability that, in use, information will be unrecoverable or that a mis-correct will occur.

3.   The method of claim 1, comprising determining,
20 from accessing the set of storage cells, one or more failed cells, and determining symbols in a block of ECC encoded data that, in use, would be affected by the failed cells.

25 4.   The method of claim 1, comprising determining, from accessing the set of storage cells, one or more failed cells, determining the position of the identified failed cells, and from this determining one or more symbols of ECC encoded data which, in use, would be
30 affected by failed cells in those positions.

5.   The method of claim 4, comprising determining whether there would be more failed symbols in a block of

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Claims

1.   A method for testing a magnetoresistive solid-state storage device, the method comprising the steps of:

accessing a set of magnetoresistive storage cells, the set being arranged in use to store at least one block of ECC encoded data; and

determining whether the accessed set of storage cells is suitable for, in use, storing at least one block of ECC encoded data.

2.   The method of claim 1, comprising determining whether there is a greater than acceptable probability that, in use, information will be unrecoverable or that a mis-correct will occur.

3.   The method of claim 1, comprising determining, from accessing the set of storage cells, one or more failed cells, and determining symbols in a block of ECC encoded data that, in use, would be affected by the failed cells.

4.   The method of claim 1, comprising determining, from accessing the set of storage cells, one or more failed cells, determining the position of the identified failed cells, and from this determining one or more symbols of ECC encoded data which, in use, would be affected by failed cells in those positions.

5.   The method of claim 4, comprising determining whether there would be more failed symbols in a block of

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ECC encoded data than could be reliably corrected by, in use, error correction decoding the block of ECC encoded data.

5 6.   The method of claim 1, comprising:

obtaining a parametric value for each of the set of storage cells;

10   comparing each parametric value against a range or ranges; and

identifying failed cell or cells, amongst the set of storage cells, as being affected by a physical failure, 15 where the parametric value falls into one or more failure ranges.

7.   The method of claim 6, comprising identifying storage cells for which a logical bit value is derivable.

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8.   The method of claim 6, comprising forming a failure count based on the identified failed cells, and comparing the failure count against a threshold value.

25 9.   The method of claim 8, comprising using the identified failed cells to determine failed symbols, and wherein the failure count is based on the failed symbols.

10.   The method of claim 9, wherein the threshold value 30 represents a number of failed symbols equal to or less than a total number of failed symbols which, in use, could be reliably corrected by error correction decoding a block

of ECC encoded data to be stored in the accessed set of storage cells.

11.   The method of claim 10, wherein the threshold
5 value is set to be in the range of about 50% to about 95% of the maximum number of failed symbols which could be reliably corrected by error correction decoding the block of ECC encoded data.

10 12.   The method of claim 1, comprising:

writing test data to the set of storage cells;

reading the test data from the set of storage cells;
15 and

comparing the written test data to the read test data to identify a failed cell or cells amongst the set of storage cells as being affected by a physical failure.

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13.   The method of claim 12, comprising forming a failure count based on the identified failed cells, and comparing the failure count against a threshold value.

25 14.   The method of claim 12, comprising using the identified failed cells to determine failed symbols, and wherein the failure count is based on the failed symbols.

15.   The method of claim 14, wherein the threshold
30 value represents a number of failed symbols equal to or less than a total number of failed symbols which, in use, could be reliably corrected by error correction decoding a

block of ECC encoded data to be stored in the accessed set of storage cells.

16.   The method of claim 15, wherein the threshold value is set to be in the range of about 50% to about 95% of the maximum number of failed symbols which could be corrected by error correction decoding the block of ECC encoded data.

17.   A method for controlling a magnetoresistive solid-state storage device, comprising the steps of:

accessing a set of magnetoresistive storage cells, the set being arranged in use to store at least one block of ECC encoded data;

comparing parametric values obtained by accessing the set of storage cells against one or more ranges;

identifying failed cells amongst the accessed set of storage cells;

forming a failure count based on the identified failed cells;

comparing the failure count against a threshold value; and

determining whether the accessed set of storage cells is suitable for, in use, storing at least one block of ECC encoded data.

18.   A method for controlling a magneto-resistive
solid-state storage device, comprising the steps of:

accessing a set of magnetoresistive storage cells, the
5   set being arranged in use to store at least one block of
ECC encoded data;

writing test data to the accessed set of storage
cells;

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reading test data from the accessed set of storage
cells;

comparing the written test data against the read test
15   data, to identify failed cells amongst the accessed set of
storage cells;

forming a failure count based on the identified failed
cells;

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comparing the failure count against a threshold value;
and

determining whether the accessed set of storage cells
25   is suitable for, in use, storing at least one block of ECC
encoded data.

19.   A method for controlling a magnetoresistive
solid-state storage device, comprising the steps of:

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accessing a set of magnetoresistive storage cells, the
set being arranged in use to store at least one block of
ECC encoded data;

comparing parametric values obtained by accessing the set of storage cells against one or more ranges and thereby identifying failed cells amongst the accessed set

5   of storage cells;

performing write-read-compare on test data in the accessed set of storage cells, to thereby identify failed cells amongst the accessed set of storage cells;

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forming a failure count based on the identified failed cells;

comparing the failure count against a threshold value;

15   and

determining whether the accessed set of storage cells is suitable for, in use, storing at least one block of ECC encoded data.

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20.   A magnetoresistive solid-state storage device, comprising:

at least one array of magnetoresistive storage cells;

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an ECC encoding unit for, in use, forming a block of ECC encoded data from a unit of original information;

a controller arranged to store the block of ECC

30   encoded data in a set of the storage cells; and

a test unit arranged to access the set of storage cells, and determine whether the accessed set of storage

cells is suitable for, in use, storing the block of ECC encoded data.

21.   An   apparatus   comprising   the   magnetoresistive
5 solid-state storage device of claim 20.